National Aeronautics and Space Administration

NASA

Launch Services Program presents...

Interface Region Imaging Spectrograph

The Interface Region Imaging Spectrograph (IRIS) will launch aboard a Pegasus XL rocket from Vandenberg Air Force Base (VAFB) in California in 2013. IRIS will open a new window of discovery by tracing the flow of energy and plasma through the chromosphere and transition region into the sun's corona using spectrometry and imaging. IRIS is designed to provide significant new information to increase our understanding of energy transport into the corona and solar wind and will provide an archetype for all stellar atmospheres. The unique instrument capabilities, coupled with state-of-the-art, 3-D modeling, will fill a large gap in our knowledge of the solar atmosphere. The mission will extend the scientific output of existing heliophysics spacecraft that follow the effects of energy release processes from the sun to Earth.

The IRIS science investigation is centered on three themes of broad significance. They are solar and plasma physics, space weather, and astrophysics. They aim to understand how the sun's internal convective flows power atmospheric activity by answering the following questions:

1. Which types of non-thermal energy dominate in the chromosphere and beyond?
2. How does the chromosphere regulate mass and energy supply to the corona and heliosphere?
3. How do magnetic flux and matter rise through the lower atmosphere, and what role does flux emergence play in flares and mass ejections?

Launch Vehicle:
Pegasus XL

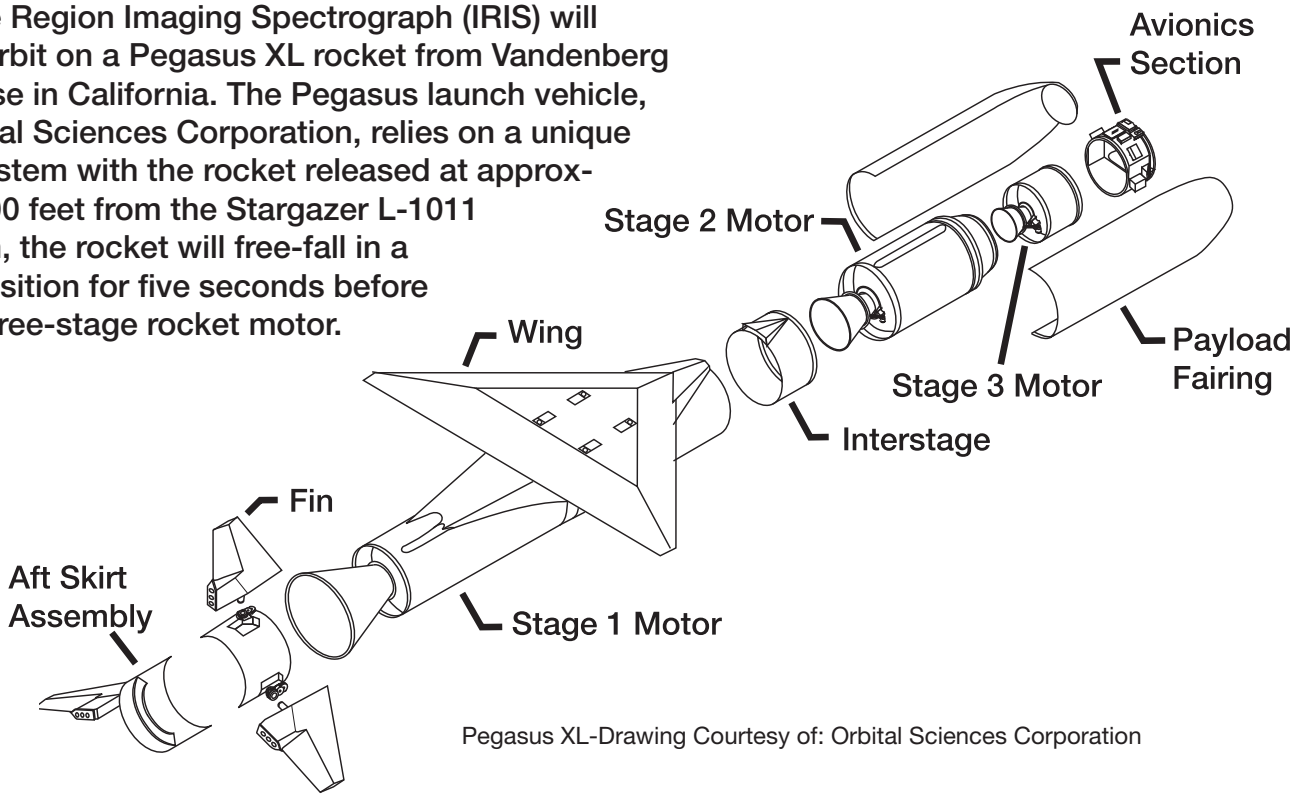
Launch Location:
Vandenberg
Air Force Base, CA.

Launch Date:
2013

www.nasa.gov

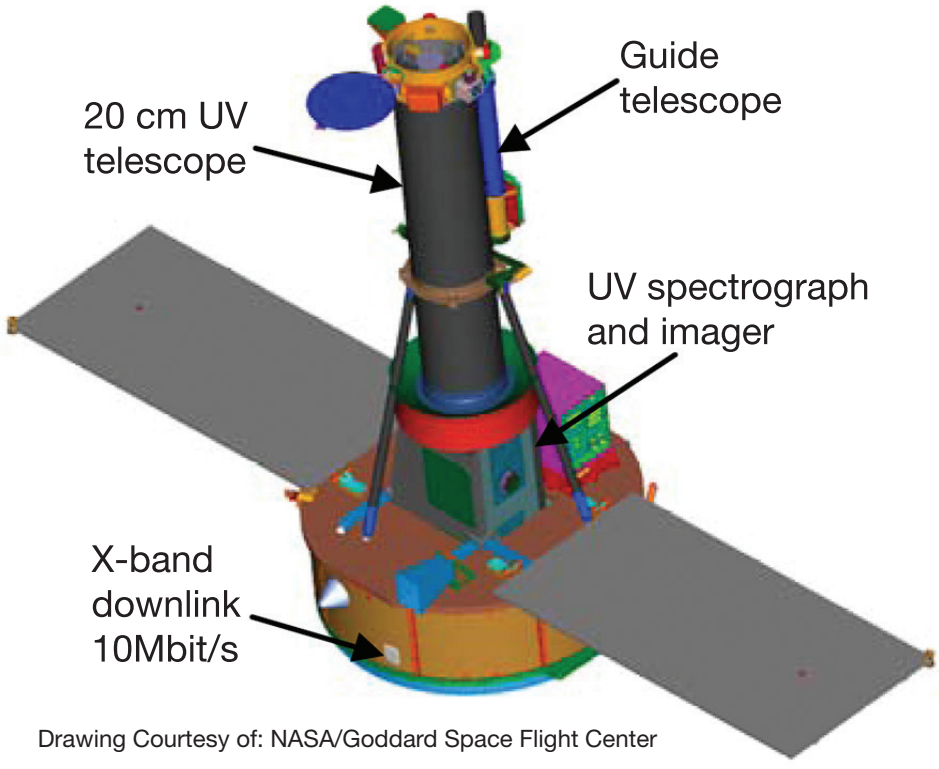
Interface Region Imaging Spectrograph (IRIS)

The Interface Region Imaging Spectrograph (IRIS) will launch into orbit on a Pegasus XL rocket from Vandenberg Air Force Base in California. The Pegasus launch vehicle, built by Orbital Sciences Corporation, relies on a unique air-launch system with the rocket released at approximately 39,000 feet from the Stargazer L-1011 aircraft. Then, the rocket will free-fall in a horizontal position for five seconds before igniting its three-stage rocket motor.



Pegasus XL-Drawing Courtesy of: Orbital Sciences Corporation

IRIS's instruments will obtain ultraviolet spectra and images with high resolution in space and time focused on the chromosphere and transition region of the sun, a complex dynamic interface region between the photosphere and corona. In this region, all but a few percent of the non-radioactive energy leaving the sun is converted into heat and radiation. Here, magnetic field and plasma exert comparable forces, resulting in a complex, dynamic region where understanding remains a challenge.



Drawing Courtesy of: NASA/Goddard Space Flight Center